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fine and the other coarse (the latter for measures of faint objects, but rarely used), are carried by each screw.

The screw-heads, divided to 100 parts, are of nearly two inches diameter, and are fitted with bolts, so that either web may be fixed as zero-wire, while the other is used in making the measures. There is a battery of seven eye-pieces, with magnifying powers from 115 to 515, and, by the use of an achromatic concave Barlow-lens, the magnifying power may be increased in the proportion of about 2·25 to 1. The micrometer is also fitted with a convenient slipping-piece. The value of one revolution of the screw is 18″·2949, and with the Barlow-lens, 8″·0765.

In reducing the observations, the arithmetical mean is taken as the mean for the night. To each individual measure a number is assigned (1–9) expressive of its estimated worth, and the sum of these numbers is taken as the weight of the set, which is thus a function of the number of observations and of the estimated value of each measure. In forming the " Mean results " (or mean of several nights' measures), this number is introduced as the *combination weight.*

Being interested in the observation of Variable Stars, I found it convenient to adopt Mr. Pogson's standard scale, or Argelander's scale extended to the lower magnitudes by the adopted light-ratio 2·512. (*Monthly Notices*, vol. xvii. p. 15.) The numbers expressing the magnitudes will be found therefore to lie generally between those of Σ on the one hand, and that of H. and Sm. on the other, the difference being more marked in the lower magnitudes. Although, for convenience, the magnitudes are expressed decimally, they must not be regarded as making any pretensions to very close accuracy.

Cuckfield,
1877, *January* 11.

On the Orbit of α Centauri. By J. R. Hind.

Having been lately favoured by Lord Lindsay with the results of two sets of measures of the angle of position of *α Centauri* made with the heliometer at the Mauritius in November 1874, during his Lordship's expedition for the observation of the transit of *Venus*, I have attempted a further approximation to the elements of this most interesting binary.

I employed the last orbit by Mr. Eyre B. Powell, of Madras, in the formation of equations of condition, for the epochs of the most reliable mean results, depending on the measures of Sir John Herschel, Captain Jacob, Mr. Powell, and Lord Lindsay, at the same time admitting the angle for 1752·2 given by Lacaille's Right

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Ascension and Declination. The elements obtained by the solution of the equations are as follow:—

Peri-astron passage	1874·85
	° ′
Node	21 48·0
Node to peri-astron on orbit	59 32·1
Inclination	82 18·4
Angle of eccentricity	41 51·5
or e = 0·6673	
	″
Semi-axis major	21·797
	yrs.
Period of revolution	85·042

The following is the comparison with observations:—

		Position (C−O).	Distance (C−O).	
		°	″	
Lacaille	1752·2	−0·8	−4·7	
Brisbane	1825·0	−4·0	+0·2	
Johnson	1830·0	−2·1	+0·2	
Cape	1833·0	−2·9	+0·1	
Herschel	1836·00	−2·6	...	
„	1836·06	...	−0·23	
Cape	1840·0	+3·9	−3·22	
Jacob	1846·75	−2·7	−1·07	
„	1848·02	−2·6	−0·28	
„	1850·83	−2·1	−0·32	
„	1852·23	−2·7	−0·15	
„	1856·27	+1·6	−0·16	
„	1857·15	+1·0	+0·03	
Powell	1859·38	+0·9	−0·98	
„	1860·11	+1·0	−0·18	
„	1861·05	+1·0	+0·06	
„	1862·21	−0·7	+0·11	
„	1863·08	−0·7	+0·29	
„	1863·11	−4·9	−0·34	Position preferred by Powell to last
„	1870·10	−3·0	+0·23	
Lindsay	1874·85	+0·4	...	

It will be remarked that Lord Lindsay's measures fall exactly at the computed time of nearest approach of the component stars in the real orbit. Probably a somewhat closer

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representation of the observed angles and distances might be obtained by repeating the process upon which the above elements were deduced, but I defer any further computation in the hope of soon receiving measures made after the passage of the peri-astron.

Lord Lindsay's epoch, as used above, is,

1874·85 34°·17

If, for the annual parallax, a mean of Henderson's value, as corrected by Peters, and that of Moesta, be taken, giving 0″·928, we find the mass of this system = 1·79 × ⊙'s mass, and for the semi-axis major of the orbit 23·49.

Ephemeris for Determining the Positions of the Satellites of Uranus, 1877.

By A. Marth, Esq.

(*Communicated by A. C. Ranyard, Esq.*)

Greenw. Noon. 1877.	*p*	Ariel.		Umbriel.		Titania.		Oberon.	
		log *a*	log *b*	log *a*	log *b*	log *a*	log *b*	log *a*	log *b*
Jan. 25	10·48	1·1811	0·7569	1·3251	0·9009	1·5400	1·1158	1·6662	1·2420
30	10·41	·1817	·7613	·3257	·9053	·5406	·1204	·6668	·2464
Feb. 4	10·34	·1821	·7656	·3261	·9096	·5410	·1245	·6672	·2507
9	10·27	·1823	·7697	·3263	·9137	·5412	·1286	·6674	·2548
14	10·21	·1823	·7736	·3263	·9176	·5412	·1325	·6674	·2587
19	10·14	·1822	·7772	·3262	·9212	·5411	·1361	·6673	·2623
24	10·07	·1818	·7806	·3258	·9246	·5407	·1395	·6669	·2657
Mar. 1	10·01	·1812	·7836	·3252	·9276	·5401	·1425	·6663	·2687
6	9·95	·1804	·7862	·3244	·9302	·5393	·1451	·6655	·2713
11	9·89	·1795	·7885	·3235	·9325	·5384	·1474	·6646	·2736
16	9·83	·1784	·7903	·3224	·9343	·5373	·1492	·6635	·2754
21	9·78	·1772	·7918	·3212	·9358	·5361	·1507	·6623	·2769
26	9·73	·1758	·7928	·3198	·9368	·5347	·1517	·6609	·2779
31	9·69	·1743	·7934	·3183	·9374	·5332	·1523	·6594	·2785
Apr. 5	9·66	·1727	·7935	·3167	·9375	·5316	·1524	·6578	·2786
10	9·63	·1710	·7932	·3150	·9372	·5299	·1521	·6561	·2783
15	9·61	·1692	·7925	·3132	·9365	·5281	·1514	·6543	·2776
20	9·60	·1673	·7913	·3113	·9353	·5262	·1502	·6524	·2764
25	9·59	·1654	·7896	·3094	·9337	·5243	·1486	·6505	·2748
30	9·59	·1635	·7878	·3075	·9318	·5224	·1467	·6486	·2729
May 5	9·60	1·1615	0·7854	1·3055	0·9294	1·5204	1·1443	1·6466	1·2705